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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

GELIN, JEAN ALLAND

ART UNIT	PAPER NUMBER
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2617

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09/17/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/812,284	Applicant(s) SADRI ET AL.	
	Examiner Jean A. Gelin	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,6,10 and 15-39 is/are rejected.
- 7) ☒ Claim(s) 7-9 and 11-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is in response to the Applicant's arguments and amendments filed on 06/28/07 in which claims 1, 26, 34, and 37 have been amended, and claims 3 and 4 have been canceled. Claims 1, 2, and 5-39 are currently pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 18-20, 22-26, 29-33, and 37-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Walton et al. (US 6,785,641).

Regarding claim 18, Walton teaches a wireless apparatus (fig. 3 and fig. 5) comprising: a frequency demultiplexer to separate a received multicarrier signal into multiple portions based on frequency, said multiple portions corresponding to a plurality of predetermined frequency sub-channels and including at least a first portion and a second portion (col. 7, line 46 to col. 8, line 57, and col. 15, lines 20-65); a first Fourier transform unit to convert said first portion of said multicarrier signal from a time domain representation to a frequency domain representation (col. 7, line 46 to col. 8, line 57, and col. 15, lines 20-65); and a second Fourier transform unit to convert said second

Art Unit: 2617

portion of said multicarrier signal from a time domain representation to a frequency domain representation, separately from said first portion of said multicarrier signal (col. 7, line 46 to col. 8, line 57, and col. 15, lines 20-65).

Regarding claim 19, Walton teaches said second Fourier transform unit is a different unit from said first Fourier transform unit (fig. 3).

Regarding claim 20, Walton teaches said first and second Fourier transform units are the same unit, wherein said unit processes said first and second portions of said multicarrier signal at different times (col. 7, line 46 to col. 8, line 57, and col. 15, lines 20-65).

Regarding claim 22, Walton teaches an adaptive channelization controller to determine which of said plurality of predetermined frequency sub-channels to use to support a multicarrier wireless link, based on channel state information (col. 6, line 56 to col. 7, line 45).

Regarding claim 23, Walton teaches said received multicarrier signal is an orthogonal frequency division multiplexing (OFDM) multicarrier signal (col. 7, line 46 to col. 8, line 63).

Regarding claim 24, Walton teaches at least one other Fourier transform unit to convert at least one other portion of said multicarrier signal from a time domain representation to a frequency domain representation (col. 7, line 46 to col. 8, line 63).

Regarding claim 25, Walton teaches said frequency demultiplexer includes an analog filter (col. 19, lines 33-44).

Regarding claims 26, 37, Walton teaches acquiring channel state information associated with a channel having a plurality of sub-channels (col. 5, lines 50-65, col. 7, lines 47 to col. 8, line 56); determining which sub-channels within said plurality of sub-channels to use for a wireless link based on said channel state information (col. 2, lines 52-59 and col. 5, lines 11-67); and delivering sub-channel adaptation information to a receiver chain for use in processing a multicarrier receive signal associated with said wireless link (col. 5, lines 1-67).

Regarding claim 29, Walton teaches determining which sub-channels within said plurality of sub-channels to use for said wireless link includes identifying sub-channels that are not currently being used by other links (col. 6, line 56 to col. 7, line 45).

Regarding claim 30, Walton teaches delivering sub-channel adaptation information to a transmitter chain for use in generating a multicarrier transmit signal for said wireless link (col. 5, lines 1-67).

Regarding claim 31, Walton teaches dividing a received multicarrier signal into a plurality of frequency sub-channel components (fig. 3, items 310, col. 15, lines 41-58); and individually transforming each of said plurality of frequency sub-channel components from a time domain representation to a frequency domain representation (col. 8, lines 37-57, col. 17, lines 10-33, and col. 32, line 63 to col. 33, line 49).

Regarding claim 32, Walton teaches converting said frequency domain representations resulting from individually transforming said plurality of frequency sub-channel components to a single serial stream based on control information received from an adaptive channelization controller (col. 7, line 46 to col. 8, line 62).

Regarding claim 33, Walton teaches individually transforming includes applying each of said plurality of frequency sub-channel components to a separate Fourier transform unit (see fig. 3, (col. 7, line 46 to col. 8, line 62).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, , 6, 10, 15, and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catreux in view of Walton et al. (US 6,785,341).

Regarding claim 1, Catreux teaches a wireless apparatus (fig. 3 and fig. 6) comprising: an adaptive channelization controller to determine which of a plurality of predetermined sub-channels to use to support a multicarrier wireless link, based on channel state information ([0022], [0024], and [0038]); and a receiver chain to process a received multicarrier signal associated with said multicarrier wireless link based on control information output by said adaptive channelization controller ([0027] and [0042]-[0043]).

Catreux does not specifically teach a frequency demultiplexer to separate said received multicarrier signal into multiple portions based on frequency, said multiple portions corresponding to said plurality of predetermined sub-channels and a plurality of Fourier transform units to separately process said multiple signal portions output by said

Art Unit: 2617

frequency demultiplexer, said plurality of Fourier transform units includes at least one first Fourier transform unit to process a first signal portion and a second Fourier transform unit to process a second signal portion.

However, the preceding limitations are known in the art of communications. Walton a receiver having a demultiplexer, an FFT processor (plurality of Fourier transform) in each demodulator when OFDM is employed for data transmission, and each frequency sub-channel from the FFT are independently processed (col. 15, lines 20-57 and col. 16, line 50 to col. 17, line 6). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Walton within the system Catreux in order to process data in MIMO communication system utilizing channel state information to provide improved system performance.

Regarding claim 2, Catreux in view of Walton teaches all the limitations above. Catreux further teaches comprising: a transmitter chain to generate a multicarrier transmit signal for said multicarrier wireless link based on control information output by said adaptive channelization controller ([0021]-[0022] and [0024]-[0028]).

Regarding claim 6, Catreux in view of Walton teaches all the limitations above. Walton further teaches said plurality of Fourier transform units includes at least one fast Fourier transform unit (col. 15, lines 44-55).

Regarding claim 10, Catreux teaches all the limitations above except said transmitter chain comprises a forward error correction (FEC) encoder to encode source data and an adaptive mapper to map the encoded data based on a predetermined modulation constellation.

However, the preceding limitation is known in the art of communications. Walton teaches the FEC code is selected to be powerfull enough to allow the symbols transmitted from the worse case transmit antenna to be correctly received at the receiver system (col. 33, line 58 to col. 34, line 51 to col. 35, line 16). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Walton within the system of Catreux in order to process data in MIMO communication system utilizing channel state information to provide improved system performance.

Regarding claim 15, Catreux in view of Walton teaches all the limitations above. Catreux further teaches said adaptive channelization controller, said receiver chain, and said transmitter chain are all implemented on the same semiconductor chip (fig. 3 or fig. 6).

Regarding claim 38, Walton teaches determining which sub-channels within said plurality of sub-channels to use for said wireless link includes identifying sub-channels that are not currently being used by other links (col. 6, line 56 to col. 7, line 45).

Regarding claim 39, Walton teaches delivering sub-channel adaptation information to a transmitter chain for use in generating a multicarrier transmit signal for said wireless link (col. 5, lines 1-67).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Catreux in view of Walton et al. (US 6,785,341) further in view of Hammerschmidt (US 2004/0151145).

Regarding claim 5, Catreux in view of Walton teaches all the limitations above except a guard interval removal unit between said frequency demultiplexer and said plurality of Fourier transform units to remove guard intervals from said multiple signal portions output by said frequency demultiplexer.

However, the preceding limitation is known in the art of communications. Hammerschmidt teaches in fig. 1 a receiver having removable circuitry to strip each symbol of the cyclic prefix and applies the result to a converter ([0009] and [0030]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Catreux in view of Walton in order to remove noise in the received signal, reduce interferences, and increase signal quality.

7. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catreux in view of Walton further in view of Hammerschmidt (US 2004/0151145).

Regarding claims 16-17, Catreux in view of Walton teaches all the limitations above except said channel state information includes information received from a remote location.

However, the preceding limitation is known in the art of communications. Hammerschmidt teaches two circuits are controlled by a channel state information (CSI) processor to receive signals from RF receivers and MAC ([0032]-[0034]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Catreux and Walton

in order to extend the range corresponding to a selected transmission bit rate and or to increase the transmission bit rate between an access point and a client terminal.

8. Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al. (US 6,785,341) further in view of Hammerschmidt (US 2004/0151145).

Regarding claim 21, Walton teaches all the limitations above except a guard interval removal unit between said frequency demultiplexer and said first Fourier transform units to remove guard intervals from said first signal portions before said first signal portion reaches said first Fourier transform unit.

However, the preceding limitation is known in the art of communications. Hammerschmidt teaches in fig. 1 a receiver having removable circuitry to strip each symbol of the cyclic prefix and applies the result to a converter ([0009] and [0030]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Walton in view of Walton in order to remove noise in the received signal, reduce interferences, and increase signal quality.

9. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton in view of Hammerschmidt (US 2004/0151145).

Regarding claims 27-28, Walton teaches all the limitations above except said channel state information includes information received from a remote location.

However, the preceding limitation is known in the art of communications. Hammerschmidt teaches two circuits are controlled by a channel state information (CSI) processor to receive signals from RF receivers and MAC ([0032]-[0034]). Therefore, it

would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Walton in order to extend the range corresponding to a selected transmission bit rate and or to increase the transmission bit rate between an access point and a client terminal.

10. Claims 34-36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al. (US 6,785,341) further in view of Maltsev et al. (US 2004/0190637).

Regarding claims 34, and 36, Walton teaches an adaptive channelization controller to determine which of a plurality of predetermined sub-channels to use to support a multicarrier wireless link, based on channel state information (col. 6, line 56 to col. 7, line 45); and a receiver chain to process said received multicarrier signal based on control information output by said adaptive channelization controller (col. 6, line 56 to col. 7, line 45).

Walton fails to teach at least one dipole antenna to receive a multicarrier signal associated with said wireless link.

However, the preceding limitation is known in the art of communications. Maltsev teaches an OFDM unit having a dipole antenna suitable for reception and transmission of multicarrier communication signals including OFDM packets ([0016]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Maltsev within the system of Walton in order to receive signals that includes OFDM packets.

Regarding claim 35, Walton teaches an adaptive channelization controller determines which of said plurality of predetermined sub-channels to use to support said multicarrier wireless link by identifying sub-channels that are currently being utilized by other wireless links (col. 6, line 56 to col. 7, line 45).

Allowable Subject Matter

11. Claims 7-9, 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

12. Applicant's arguments filed 06/28/07 have been fully considered but they are not persuasive.

As per claim 1, the Applicant argues that Catreux does not disclose a frequency demultiplexer to separate said received multicarrier signal into multiple portions based on frequency, said multiple portions corresponding to said plurality of predetermined sub-channels and a plurality of Fourier transform units to separately process said multiple signal portions output by said frequency demultiplexer, said plurality of Fourier transform units includes at least one first Fourier transform unit to process a first signal portion and a second Fourier transform unit to process a second signal portion. As amended, Claim 1 is not anticipated by Walton. However, the Examiner disagrees with the preceding assertion. Walton discloses a receiver having a demultiplexer, an FFT

Art Unit: 2617

processor in each demodulator when OFDM is employed for data transmission, and each frequency sub-channel from the FFT are independently processed (col. 15, lines 20-57 and col. 16, line 50 to col. 17, line 6). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Walton within the system Catreux in order to process data in MIMO communication system utilizing channel state information to provide improved system performance. The rejection is maintained and is made final.

As per claims 2 and 15, the Applicant argues that claims 2 and 15 are allowable for the reasons set forth in claim 1 above. Given that claims 1 is still rejected. Therefore, claims 2 and 15 are rejected for reasons recited above.

As per claims 6 and 10, the Applicant further argues that these claims are allowable because they dependent from allowable claim 1. Given that claims 1 is rejected as recited above, therefore the rejections of claims 6 and 10 are maintained and the rejection is made final

As per claim 18, the Applicant further argues that a frequency demultiplexer to separate a received multicarrier signal into multiple portions based on frequency, said multiple portions corresponding to a plurality of predetermined frequency sub-channels and including at least a first portion and a second portion and a first Fourier transform unit to convert said first portion of said multicarrier signal from a time domain representation to a frequency domain representation and a second Fourier transform unit to convert said second portion of said multicarrier signal from a time domain

representation to a frequency domain representation, separately from said first portion of said multicarrier signal.

However, the Examiner disagrees with the preceding arguments. Walton discloses, fig. 3, a demultiplexer to separate information signal into multiple portions D1...Dn corresponding to frequency sub-channels 310A... 310L (fig. 3). Walton further teaches each demodulator includes an FFT which converts the received multicarrier signal to a frequency domain representation. At least two demodulators are disclosed in Walton corresponding to a plurality of FFT. Therefore, the rejection is maintained and is made final.

As per claim 31, the Applicant further argues that Walton fails to teach dividing a received multicarrier signal into a plurality of frequency sub-channel components; and individually transforming each of said plurality of frequency sub-channel components from a time domain representation to a frequency domain representation. However, the Examiner disagrees with the preceding assertion. Walton teaches, in fig. 3, a demultiplexer to receive information signal and divide it into a plurality frequency sub-channels 310A... 310L (fig. 3). Walton further teaches each demodulator includes an FFT to convert the received multicarrier signal to a frequency domain representation. At least two demodulators are disclosed in Walton corresponding to a plurality of FFT. Therefore, the rejection is maintained and is made final.

As per claims 19-20, 29-30, 32-33, and 38-39, the Applicant further argues that these claims are allowable because they dependent from allowable claims 18, 26, 31, and 37. Given that claims 18, 26, 31, 37 are rejected as recited above, therefore the

rejections of claims 19-20, 29-30, 32-33, and 38-39 are maintained and the rejection is made final.

As per claims 16-17, 21, and 27-28, the Applicant further argues that these claims are allowable because they dependent from allowable independent claims. Given that independent claims are rejected as recited above, therefore the rejections of claims 16-17, 21, and 27-28 are maintained and the rejection is made final.

The Applicant further argues that claim 34 has been amended to include the added limitations of claim 1 and the claim is allowable. The Examiner disagrees with the preceding assertion because claim is still rejected. Therefore the rejection of claim 34 is maintained for the same reasons recited in claim 1 above.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ma et al.

US 20040062193

04/01/2004

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2617

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean A. Gelin whose telephone number is (571) 272-7842. The examiner can normally be reached on 9:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Appiah can be reached on (571) 272-7904. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JEAN GELIN
PRIMARY EXAMINER

JGelin
September 12, 2007

